GIBBON RIVER BRIDGE I
Yellowstone Roads and Bridges
Spanning Gibbon River on Grand Loop Road
Yellowstone National Park
Park County
Wyoming

HAER No. WY-29

BLACK & WHITE PHOTOGRAPHS

REDUCED COPIES OF MEASURED DRAWINGS

WRITTEN HISTORICAL & DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, DC 20013-7127

Rocky Mountain Regional Office
National Park Service
U.S. Department of the Interior
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HISTORIC AMERICAN ENGINEERING RECORD

GIBBON RIVER BRIDGE I

~~HAER WY-29~~

Location:	Spanning Gibbon River on Grand Loop Road, 5 miles south of Norris Junction, Yellowstone National Park, Park County, Wyoming UTM: Norris Junction, WY, Quad. 12/520320/4947700
Date of Construction:	1938
Owner:	Yellowstone National Park, National Park Service
Use:	Vehicular bridge
Designer:	Architectural plans by W.G. Carnes, National Park Service General plans and specifications by V.C.H., Bureau of Public Roads
Builder:	Strong & Grant, Springville, Utah
Significance:	Gibbon River Bridge I typifies the early design philosophy of the National Park Service, which was to use indigenous materials to harmonize man-made features with their natural surroundings. This philosophy is embodied in many of the park's Rustic Style buildings and structures.
Project Information:	Documentation of Gibbon River Bridge I is part of the Yellowstone Roads and Bridges Recording Project, conducted during the summer of 1989 by the Historic American Engineering Record, a division of the National Park Service, under the co-sponsorship of Yellowstone National Park, the NPS Roads and Bridges Program, and the NPS Rocky Mountain Regional Office, Denver. Historical research and written narrative by Mary Shivers Culpin, Historian, NPS Rocky Mountain Regional Office. Engineering description by Steven M. Varner, Virginia Polytechnic Institute. Edited and transmitted by Lola Bennett, HAER Historian, 1993.

HISTORY OF GRAND LOOP ROAD

(See HAER WY-24, Yellowstone Roads and Bridges.)

HISTORY OF GRAND LOOP ROAD: MAMMOTH HOT SPRINGS TO MADISON JUNCTION

(See HAER WY-28, Seven Mile Bridge.)

DESIGN AND CONSTRUCTION OF GIBBON RIVER BRIDGE I

Gibbon River Bridge I, completed in 1938, carries Grand Loop Road over Gibbon River, 4.9 miles south of Norris Junction. The bridge replaced a narrow pony truss structure built by the Army Corps of Engineers in 1910.

The location survey for the bridge was one of the first projects of the Bureau of Public Roads after they assumed responsibility for road and bridge construction in Yellowstone National Park in 1926. The 1927 survey between Norris Junction and Madison Junction successfully designed the new road alignment to fit the location of the existing 1910 Army-built bridges with major improvements to the bridge approaches.

Plans for Gibbon River Bridge I were completed by the Regional Office of the Bureau of Public Roads, with the National Park Service Division of Plans and Design contributing the architectural designs. Strong and Grant of Springville, Utah, was awarded the contract on September 25, 1936. Between the end of May and the middle of November 1937, work progressed on the bridge. Test holes for excavations for the abutments and piers one and two revealed that solid rock foundations were available at higher elevations than the plans had indicated. Thus, the seal concrete was eliminated. The bridge was completed with the exception of the steel handrails, concrete curb work, four masonry wings, and the painting of the structural steel. On July 3, 1938, the bridge was open to traffic.[1]

DESCRIPTION

The bridge is a steel, I-beam continuous girder type, with spans of 35', 40', and 35', constructed on stone masonry abutments and piers, with a reinforced-concrete deck and steel guardrail. The span lengths are measured from center of support to center of support. The structure's length is 110' from end of backwall to end of backwall. The deck width is 29'-2" while the bridge roadway, curb-to-curb, is 24' wide.

The design load was 15 tons and the grade of the bridge was 0.00 percent. The slab is 7¾" thick and is reinforced with longitudinal and transverse bars. The longitudinal bars are ½"-diameter at 2-foot centers while the transverse bars are ⅜"-diameter at 5½-inch centers. There are fifteen simple steel girders supporting the deck. The girders are 24-inch WF sections weighing 74 pounds per foot. The outer six are encased in concrete with the bottom flange exposed. The girders are transversely braced with 16-inch WF sections weighing 36 pounds per foot over the abutments and piers and with 12-inch channels weighing 20.7 pounds per foot at midspan. These braces are placed in a line over the abutments and piers and in the middle of the span. The girders rest on steel bearing plates 2½" thick on the abutments and 2¾" thick on the piers. There are three bearing plates in each assembly.[2]

The plans called for all exposed concrete to be stained with two coats of concrete chemical stain, Keramic or equal, and the steel rail to be painted with two coats of green paint. The concrete was not stained because the desired color could not be obtained. Since the concrete was not stained, a third coat of white paint was put on the steel rail to better blend with the unstained

concrete.[3]

The guardrail is made of steel bar posts 2"x5" set in concrete on 6'-8" centers. The posts rise 2'-3" from the curb. The horizontal members of the guardrail are 4-inch channels weighing 6.25 pounds per foot which frame into the bar posts near the top and bottom. One-inch square bars on 8-inch centers run vertically between the channels which cup downwards.[4]

The abutments and piers are masonry on spread footings and rest on firm material. They rise 11'-3" from river bed to girders. The abutments and piers batter 1:12 on the sides running transversely to the bridge and 2:12 on the sides running longitudinally to the bridge. The abutments are U-shaped with flared, 34-foot wing walls.[5]

The reinforcing steel for this bridge was purchased from the Provo Foundry and Machine Company in Provo, Utah, and hauled to the bridge site by the contractor. Coarse and fine aggregate was taken from near the site. The structural steel came from the American Bridge Company. The cement came from the Idaho Portland Cement Company from Inkom, Idaho.[6]

The bridge, which was completed in July 1938, cost $38,827.63.[7]

ENDNOTES

1.E.O. Anderson, "Final Construction Report (1936-38) on Grand Loop National Park Highway 1-B1 Bridges," 1 March 1939, Bureau of Public Roads, U.S. Department of Agriculture.

2.Gibbon River Bridge, Station 465+70, Plans, 1-3/4, January 1936, Bureau of Public Roads, U.S. Department of Agriculture.

3.Anderson, "Final Construction Report (1936-38) on Grand Loop National Park Highway 1-B1 Bridges."

4.Gibbon River Bridge, Station 465+70 Plans.

5.Ibid.

6.Anderson.

7.Ibid.

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5.Ibid.

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7.Ibid.